

Notice of Allowability

Application No.

09/813,445

Examiner

Michael P. Mooney

Applicant(s)

LIN ET AL.

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AM

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/26/04 Amdt.
2. ☒ The allowed claim(s) is/are 1-10, 14, 15, 17 and 21-31.
3. ☒ The drawings filed on 3/20/01 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

The prior art, either alone or in combination, does not disclose or render obvious a fiber device comprising a sleeve having an elongated tubular body with an input terminal and an output terminal; an input fiber ferrule placed in said sleeve at said input terminal; a plurality of pump fibers bundled together at one fiber terminals by said input fiber ferrule to form a pump fiber bundle, wherein end facets of said bundled fiber terminals are polished to form an optical pump coupling surface for outputting pump light from said pump fibers; a plurality of lasers respectively coupled to said pump fibers to produce light into each pump fiber; an output fiber ferrule placed in said sleeve at said output terminal; a double-clad fiber having a fiber core, an inner cladding layer surrounding said fiber core, and an outer cladding layer surrounding said inner cladding layer, said double-clad fiber further including a pump-receiving terminal coupled to said output fiber ferrule to receive said pump light into said inner cladding layer, wherein said double-clad fiber includes a fiber loop in which said fiber core is doped with active ions to produce optical gain; a lens disposed in said sleeve between said input and said output fiber ferrules to image said optical pump coupling surface onto said pump-receiving terminal, wherein said lens has a numerical aperture not greater than a numerical aperture of said inner cladding layer; a first set of wavelength-selective reflectors formed in said double-clad fiber between said pump-receiving terminal and said fiber loop, each reflector operable to reflect light at a selected wavelength while

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transmitting light at other wavelengths; and a second set of wavelength-selective reflectors formed in said double-clad fiber on a side of said fiber loop opposite to said first set of wavelength-selective reflectors, each reflector operable to reflect light at a selected wavelength while transmitting light at other wavelengths in combination with the rest of claim 1.

It is noted that the claim 1 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a fiber device comprising a sleeve having an elongated tubular body with an input terminal and an output terminal; an input fiber ferrule placed in said sleeve at said input terminal; a plurality of pump fibers bundled together at one fiber terminals by said input fiber ferrule to form a pump fiber bundle, wherein end facets of said bundled fiber terminals are polished to form an optical pump coupling surface for outputting pump light from said pump fibers; a plurality of lasers respectively coupled to said pump fibers to produce light into each pump fiber; an output fiber ferrule placed in said sleeve at said output terminal; a double-clad fiber having a fiber core, an inner cladding layer surrounding said fiber core, and an outer cladding layer surrounding said inner cladding layer, said double-clad fiber further including a pump-receiving terminal coupled to said output fiber ferrule to receive said pump light into said inner cladding layer, wherein said double-clad fiber includes a fiber loop in which said fiber core is doped with active ions to produce optical gain; a lens disposed in said sleeve between said input and said

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output fiber ferrules to image said optical pump coupling surface onto said pump-receiving terminal, wherein said lens has a numerical aperture not greater than a numerical aperture of said inner cladding layer; a first set of wavelength-selective reflectors formed in said double-clad fiber between said pump-receiving terminal and said fiber loop, each reflector operable to reflect light at a selected wavelength while transmitting light at other wavelengths; broadband reflector formed in said double-clad fiber on a side of said fiber loop opposite to said first set wavelength-selective reflectors and operable to reflect each selected wavelength of each reflector in said first set wavelength-selective reflectors; and an optical coupler coupled between said broadband reflector and said fiber loop to produce an optical output at a selected laser wavelength in combination with the rest of claim 14.

It is noted that the claim 14 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a fiber device comprising a sleeve having an elongated tubular body with an input terminal and an output terminal; an input fiber ferrule placed in said sleeve at said input terminal; a plurality of pump fibers bundled together at one fiber terminals by said input fiber ferrule to form a pump fiber bundle, wherein end facets of said bundled fiber terminals are polished to form an optical pump coupling surface for outputting pump

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light from said pump fibers; a plurality of lasers respectively coupled to said pump fibers to produce light into each pump fiber; an output fiber ferrule placed in said sleeve at said output terminal; a double-clad fiber having a fiber core, an inner cladding layer surrounding said fiber core, and an outer cladding layer surrounding said inner cladding layer, said double-clad fiber further including a pump-receiving terminal coupled to said output fiber ferrule to receive said pump light into said inner cladding layer, wherein said double-clad fiber includes a fiber loop in which said fiber core is doped with active ions to produce optical gain; a lens disposed in said sleeve between said input and said output fiber ferrules to image said optical pump coupling surface onto said pump-receiving terminal, wherein said lens has a numerical aperture not greater than a numerical aperture of said inner cladding layer and said lens is spaced from said input and said output fiber ferrules to image end facets of said pump fibers to an end facet of said double-clad fiber in combination with the rest of claim 15.

It is noted that the claim 15 is allowable because the unique combination of each and every specific element stated in the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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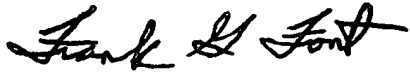
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.


Michael P. Mooney
Examiner
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Frank G. Font
Supervisory Patent Examiner
Art Unit 2877

FGF/mpm
7/23/04